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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
HUGHES, SCOTT A	

ART UNIT	PAPER NUMBER
3663	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/576,827	GRATACOS, BRUNO	
	Examiner	Art Unit	
	SCOTT A. HUGHES	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 April 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/19/2009 has been entered.

Response to Arguments

Applicant's arguments filed 2/19/2009 have been fully considered but they are not persuasive.

Applicant argues that Gaiser discloses vertical sensors that remain vertical whereas the present invention applies "omni-tilt" multi-component geophones. This argument is not persuasive, as omni-tilt geophones are not claimed. As noted by applicant, the amended claims now contain the limitation that the geophone components have "an angular orientation $\varphi\psi$." Although applicant argues that the normally vertical geophones are not constrained to remain vertical, this limitation in the claims is broader than applicant's arguments. The limitation in the claims only requires that the geophone components have some angular orientation $\varphi\psi$, without limiting omni-tilt geophones or that this angular orientation or requiring that the angular orientation be an angle other than one aligned with the vertical. As the geophone

components in Gaiser have some angular orientation φψ, even if this angular orientation includes a 0 degree orientation with respect to the z-axis (aligned with the z-axis). The language of the claim does not require that the orientation be other than aligned with the z-axis, and therefore Gaiser meets the broad limitation of geophone components with an angular orientation φψ as there is some angular orientation with respect to the horizontal x-axis and vertical z-axis for the geophones, even if the angle is zero or aligned with the axis.

Applicant argues that Gaiser specifically only uses direct and refracted first arrivals, and that the specification of the current applicant indicates that this is a convention technique. Applicant argues that contrary to Gaiser, the invention uses a complete seismic data and cites to Pages 2 and 5 of the specification where "the true data window" and a model that allows evaluation of the "reflectivity parameter from the set of traces tr_x" are described. Applicant argues that these features (cited portions of the specification) appear in the claimed invention as the claims recite "to isolate various data depending on whether they correspond to propagation with reflection or with conversion." This argument is not persuasive, as the scope of this claim limitation is broader than applicant's arguments relating to the cited portions of the specification.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., true data window, set of traces trx, other cited portions of the specification) are not recited in the rejected claim(s). Although the claims are interpreted in light of the

specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The claims only require isolating the data depending on whether they correspond to propagation with reflection or with conversion, and do not include anything that limits this to something other than direct P-wave arrivals, P-wave reflections (propagation with reflection) and PS-wave reflections (propagation with conversion) as disclosed in Gaiser. Gaiser specifically discloses that the data are isolated depending on whether they correspond to propagation with reflection (P-wave reflections) and propagation with conversion (PS-wave reflections) (Column 4, Line 1 to Column 5, Line 20). The P wave reflection signals and P-S converted wave signals are isolated and used individually in the processing of the data and the determination of the orientation in Gaiser.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-6 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-6 are process claims that are not tied to a particular machine or apparatus and that do not result in a transformation of a particular article into a different state or thing. Although the claims recite that the data is acquired by means of a sensor having at least three geophone components, the claim is directed to the data and only requires the data itself and not the sensor. The method steps are all related to

processing of this acquired data without reciting the machine or apparatus that performs the processing steps. Also, the processing of the data as claimed does not result in the transformation of the data into a different state or thing. Therefore, the process claims are not statutory subject matter.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Gaiser (6205403).

With regard to claim 1, Gaiser discloses a method of processing seismic data acquired by means of a sensor having at least three geophone components with an angular orientation $\varphi\psi$ (Figs. 1, 4) (Column 1; Column 3, Lines 10-47), wherein estimators are determined which are combinations of these components, wherein various data are isolated, through the estimators depending on whether they correspond to propagation with reflection or with conversion (Column 1; Column 3, Line 10 to Column 5, Line 58), wherein operators to be applied to the various components of the sensor are determined for determining a sensor reconstruction, the operators being those that minimize a deviation between reference data and data obtained by applying the estimators the sensor reconstruction (Column 3, Line 10 to Column 5, Line 58), the

operators thus determined being applied to the data acquired (Column 3, Line 10 to Column 5, Line 58).

With regard to claim 2, Gaiser discloses that the sensor furthermore includes a hydrophone, and that the reference data for reconstructing a vertical geophone are derived from the data acquired by the hydrophone (Column 1; Column 3, Line 10 to Column 5, Line 58).

With regard to claim 3, Gaiser discloses that the reference data for reconstructing a vertical geophone without hydrophone or for reconstructing horizontal geophones are derived from application of the estimators to one of the geophones of the sensor (Column 3, Line 10 to Column 5, Line 58).

With regard to claim 4, Gaiser discloses that the orientation in the horizontal plane of a geophone component is obtained by minimizing the estimator of the transverse reflection (Column 4, Lines 1-62).

With regard to claim 5, Gaiser discloses that the estimators are determined as a function of a model of isotropic propagation or including the azimuthal anisotropy.

With regard to claim 6, Gaiser discloses a method of processing seismic data acquired by means of a sensor having at least three geophone components (Column 1; Column 3, Lines 10-47), wherein estimators are determined which are combinations of these components, wherein various data are isolated, through the estimators, depending on whether they correspond to propagation with reflection or with conversion (Column 1; Column 3, Line 10 to Column 5, Line 58).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gaiser as applied to claims 1-4 and 6 above, and further in view of Baigini (WO0151955).

With regard to claim 5, Gaiser does not disclose that the estimators are determined as a function of a model of isotropic propagation or including the azimuthal anisotropy. Baigini teaches using estimators to restructure the components of a sensor and teaches that the estimators are determined as a function of a model of isotropic propagation or a model including the azimuthal anisotropy (Pages 5-10). It would have been obvious to modify Gaiser to include of a model of isotropic propagation or a model including the azimuthal anisotropy as taught by Baigini in order to determine the shot geometries for the geophones dependent upon their coupling.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SCOTT A. HUGHES whose telephone number is (571)272-6983. The examiner can normally be reached on M-F 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Scott A. Hughes/
Examiner, Art Unit 3663